

R(UD) 3/27/2013

Water Conservation Plan

For

Bela Brook Water Corporation

Bow, New Hampshire

March 18, 2013

Prepared by:
Underwood Engineers
99 North State Street
Concord, NH 03301

I certify that I have read this Water Conservation Plan, understand the responsibilities of the water system as referenced in the Plan, and that all information provided is complete, accurate, and not misleading.

Owner Name: Bela Brook Water Corporation, Bernie Roy, President

Owner Signature: Bernie Roy Date: 3-22-2013

This Plan has been organized in accordance with Section III, Water Conservation Plan Guidance Document for Existing Small Community Water Systems and Certain Landlord Owned Water Systems of the September 2011 NHDES document entitled "*Water Conservation Plan Guidance Document for Community Water Systems*". Items from the document's outline are included in *italics* below.

This report has been submitted to:

- NHDES
- Town of Bow, via certified mail within 7 days w/ Water Conservation Rules Summary (Env-Dw-1201)
- Capital Area Regional Planning Commission, via certified mail within 7 days w/ Water Conservation Rules Summary (Env-Dw-2101)

I. ***Introduction***

A. ***Contact Information***

1. *Name and location of System:*
Bela Brook Water System
Located behind 525 and 527 Clinton Street, Bow, NH 03304
2. *Owner of System and Mailing Address:*
Bela Brook Water Corporation
Attn: Bernie Roy
4 Kelso Drive
Bow, NH 03304
3. *Plan Prepared by:*
Underwood Engineers
99 N. State Street
Concord, NH 03301

B. ***System Overview***

1. *Reason for the new source.* The capacity of the existing well (BRW#1) had diminished over time and was no longer able to produce enough water to adequately supply the needs of the system. BRW #1 will not be abandoned and will serve as an emergency source. The well was believed to be producing less than 2 gpm and bulk water was being delivered on a weekly basis. BRW#2 was installed in August 2012 and an emergency connection approved by NHDES.
2. *Number of connections existing and proposed for each of the following classes: a) residential, b) Industrial/commercial/institutional; and c) Municipal.*
The Bela Brook Water Corporation system services 20 residential homes on Kelso Drive in Bow, NH. There are no industrial, commercial, institutional or municipal users on the system.
3. *Description of any connections that currently receive or will receive more than 20,000 gpd.*
There are no connections to the system that use over 20,000 gpd.

C. *Water Use Trends and Supporting Documentation/Population Trends*

1. *Existing, if applicable, and anticipated seasonal fluctuation in water use and reason for fluctuation.*
Seasonal fluctuations in water include slightly higher water use during the summer, likely due to typical outside water usage. Typical usage varied from approximately 3,000 gpd to 4,300 gpd over the period from 2008-2011, with the higher use periods occurring during the summer.
2. *Anticipated growth in population and seasonal fluctuations in population.*
There is no anticipated growth in population of the system; and no anticipated change in seasonal fluctuation.
3. *Maximum day yield of existing sources based on 24-hour pumping.*
The maximum day yield of BRW#2 based on 24-hour pumping would be approximately 14,400 gpd (10 gpm).
4. *Average daily water use.*
Average Daily Water use, based on historical data is approximately 3,500 gpd.
5. *Maximum daily water use.*
Maximum Daily Water use is approximately 4,300 gpd.
6. *Minimum hourly flows (if known).*
Minimum hourly flows are unknown.

D. *Source Meters*

1. *Name designation of each water source.*
System Water Sources:
BRW#2 – Current main water source
BRW#1 – Previous water source, presently off-line. Will be retained as a back-up or blended supply.
2. *Meter make, model, size, flow range and date of last calibration for each existing source meter.*
BRW#2 – The meter is a residential style displacement meter and has not been calibrated. This meter will be replaced with a similar type meter as part of the up-coming pump station upgrade. It is anticipated that the new meter will be a positive displacement meter, similar to a Neptune model T-10.
BRW#1 – is currently off-line and has no meter. A new meter will be installed during the pump station upgrade, similar to that described for BRW#2.
3. *Meter make, model, size and flow range for each new water source (if known).* The existing meter was previously used to meter flow from BRW#1 and was retained when BRW#2 was connected instead. An upgrade to the pump station is in the planning phase, and the replacement meter will be evaluated at that time.

4. *Frequency that source meters will be tested/calibrated?*
The existing meter is a residential style displacement meter. Typical manufacturer's recommendation for this type of meter is calibration every 10 years for 5/8" and 3/4" meters and every 4 years for 1-inch to 2-inch meters. The meter will be replaced during the pump station upgrade, likely with a similar style meter, and will be sized based on the design flowrate from the well. The new meter will be serviced every 4 years, in accordance with AWWA/PUC recommendations for small service meters, unless otherwise recommended by the manufacturer.
5. *Frequency that source meters will be read (at least every 30 days).*
The source meter (BRW#2) is ready weekly (total cumulative flow) and an average daily flow calculated.
6. *Statement that "The source meters will be selected, installed and maintained in compliance with "Manual of Water Supply Practices M6, Water Meters-Selection, Installation, Testing and Maintenance"(American Water Works Association, 1999)".*

II. *System Side Management*

A. *Option B: Leak Detection*

1. *Summary of findings for the most recent leak detection surveys including the following information:*
 - a.) *Years Conducted*
 - b.) *Number of Leaks Found*
 - c.) *Estimated losses recovered*
 - d.) *Percent of system surveyed*

No formal leak detection surveys have been performed on the system to date. A visual leak detection survey was conducted by the operators as a result of past water shortages. No leaks were evident. The system has never identified any known leaks.
2. *Are pipe locations known? If not, include a statement that a pipe location survey will be conducted in order to perform leak detection.*
Yes, the approximate location of pipes is known. The operator has a map showing the location of the water lines.
3. *Breakdown of pipe material, age and length.*
Pipe is 2-inch and 3-inch HDPE, installed in the early 1980's. The total length is believed to be about 2,000 ft.
4. *Availability of contact points and adequacy of spacing.*
Contact points include 1 gate valve where the line size changes from 2-inch to 3-inch, which is believed to be approximately mid-length of the line. There is also a blow-off on the end of the line, and curb stops for each of the 20 services.
5. *Is pipe material non-metallic? If yes, as leaks are difficult to acoustically detect in non-metallic systems, what additional measures will be taken to detect leaks?*
Pipe material is non-metallic; therefore, leaks are difficult to acoustically detect.

In lieu of leak detection, a new distribution meter will be installed on the piping leaving the pump house during the pump station upgrade and night time flow analysis will be conducted annually. This flow meter will be capable of capturing low-flows and would likely be a magnetic type flow meter with the appropriate straight lengths of piping to provide accurate measurement. Meters that will be considered for this application include a Khrono magnetic meter, a Sensus iPearl magnetic meter, and a Badger E-series ultrasonic meter. During the night time flow analysis, water use will be recorded every minute for one hour between 1 am and 2 am. Users of the system will be notified prior to the analysis and will be requested to refrain from water use during this time period.

If flows are above the threshold, the analysis will be repeated in 7 days. If flows during the re-test are still above the threshold, a leak will be assumed, and residents notified to check their individual home systems for leaks, which shall be reported to the system operator.

If no leaks in individual homes are identified, the single gate valve in the system will be closed to isolate the two areas of the system and the flow analysis repeated in attempt to isolate the area of the system with a leak. No later than 2 weeks from isolating the leak to a certain branch of the system, a sub-contractor skilled in acoustic leak detection will be retained to assist with pinpointing the leak.

Distribution monitoring as described above will be conducted annually in lieu of acoustic leak detection.

The threshold will be determined by conducting a night flow analysis as described above, identifying and fixing any leaks, and again doing the night flow analysis when the system is tight. The lowest flow will be the threshold.

6. *Will zone meters be installed to assist with leak detection, identification and location?*
No.
7. *Will future leak detection surveys be conducted in-house or contracted out?*
Leak detection surveys would be contracted out.
8. *If in-house, what equipment will be used and what training will be required?*
NA.
9. *If in-house, describe the leak detection method to be used.*
NA.
10. *Statement that a comprehensive leak detection survey will be conducted every two years.*
See item 5 above.

11. *Will leak detection be done all at one time or staggered throughout the two years? If staggered, what is the timeline and what percentage of the system will be surveyed during each initiative?*
Leak detection will be one all at one time.
12. *Statement that leak detection will be conducted in accordance with "Manual of Water Supply Practices M36, Water Audits and Loss Control Programs" (AWWA, 2009).*
Refer to item 5 above for alternative leak detection methods.
13. *Statement that leaks will be repaired within 60 days of discovery unless a waiver is obtained in accordance with Env-Wq 2101.09.*
As stated.

B. *Pressure Management*

1. *Existing minimum distribution pressure (anticipated pressure for new landlord owned systems).*
Existing minimum distribution pressure is 50 psi @ the pump house.
2. *Existing maximum distribution pressure (anticipated for new landlord owned systems).*
Existing maximum distribution pressure is 66 psi @ the pump house.
3. *How is pressure currently monitored and how will pressure continue to be monitored?*
Pressure is monitored manually using a pressure gage on the hydropneumatic tank in the pump house. Pressure will continue to be monitored in the pump house; however the pressure gauge will be replaced as part of the pump station upgrade.
4. *What method will be used to reduce pressure zones found to be in excess of 80 psi?*
There are no pressure zones in excess of 80 psi.
5. *What will be the timeframe for the reduction (at least within 1 year of source water approval)?*
NA.
6. *If pressure reduction is not technically feasible, please explain why and describe what additional steps the water system will take to monitor and repair leakage within these zones?*
NA.

C. *Intentional Water Loss*

1. *Are there "bleeders" used within the system at dead ends to improve water quality or prevent freeze-up? If yes, what looping opportunities exist?*
There are no "bleeders" within the system.
2. *Are storage tanks intentionally allowed to overflow because of system hydraulics or water quality concerns? If yes, what opportunities exist for the installation of altitude valves or tank mixing systems?*
Storage tanks are not intentionally allowed to overflow.

III. *Consumption Side Management*

A. *Educational Outreach Initiative*

1. *Informational materials that will be used.*
Informational materials used will be selected from the DES fact sheets titled "Water Efficiency for the Home" located at <http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/index.htm#efficiency> and from the EPA WaterSense Program "Saving Water" fact sheets located at http://www.epa.gov/watersense/our_water/learn_more.html.
2. *Rate of dissemination.*
One of the conservation related fact sheets included in the Appendix will be included with the consumer confidence report that is distributed to residents on an annual basis.
3. *Does the water system intend to become a WaterSense partner (www.epa.gov/watersense)?*
No. This is believed beyond the administrative capacity of this very small system.
4. *Will a rebate program be offered to replace older fixtures were WaterSense certified fixtures?*
No. This is believed beyond the administrative capacity of this very small system.
5. *Will customer audits be offered?*
No. This is believed beyond the administrative capacity of this very small system.
6. *Other outreach plans?*
None are planned.

IV. *Zoning Ordinance/Bylaws*

A. *Are connections to the water system subject to any of the following water efficiency ordinances or bylaws?*

No. Bela Brook Water Corporation has no authority for Zoning.

1. *Indoor*
 - a) *Water efficient fixtures beyond the existing plumbing code.* No.
2. *Landscaping*
 - a) *Minimum topsoil requirements.* No.
 - b) *Use of native/drought tolerant plants and grasses.* No
 - c) *Area and slope restrictions for turf grass.* No
3. *Irrigation System*
 - a) *Prohibition or restrictions to irrigation systems.* No
 - b) *Require moisture sensors.* No
 - c) *Require rain sensors.* No
4. *Other water efficiency ordinances?*
None.

V. Water Use Restrictions

A. *What is the water system's plan relative to implementing water restrictions?*

Water restrictions, including an outside water ban, have been in place due to past water shortages. Users are used to conserving water. It is anticipated that summer water bans would be lifted in the future, but residents will continue to practice conservation measures to the greatest extent possible.

B. *Who is responsible for enforcing restrictions?*

The Bela Brook Water Corporation.

VI. Reporting and Implementation

A. *Include the following statements:*

1. "The water system will submit a form supplied by DES once every three years documenting how compliance with the requirements of Env-Wq 2101 is being achieved."
2. Activities outlined in the water conservation plan will be completed by water system personnel under the supervision of a certified water system operator".